

Claims

【Claim 1】

A compensator film for LCD comprising:

polymer base layer;

5 protective layer prepared by coating at least one side of the polymer base layer with organic or organic/inorganic hybrid composition; and

polymer coating layer formed on top of the protective layer placed on the polymer base layer, which has negative optical retardation in out of plane direction defined as the following formula 1.

10 [Mathematical Formula 1]

$$R_{th} = (n_z - \frac{n_x + n_y}{2}) \times d$$

Wherein, n_z indicates a reflective index in out of plane direction of film, n_x and n_y indicate reflective indices in in-plane direction of film, d indicates a film thickness and R_{th} indicates the optical retardation in out of plane direction.

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【Claim 2】

The compensator film for LCD as set forth in claim 1, wherein the polymer base layer is made from polymer selected from a group of consisting of polycarbonate, triacetylcellulose, cyclo-olefin polymer, cyclo-olefin copolymer and (meth)acrylate 20 polymer or an optically uniform and transparent polymer film on which one or more of the above compounds are laminated.

【Claim 3】

The compensator film for LCD as set forth in claim 1 or claim 2, wherein the thickness of the polymer base layer is 10 ~ 300 μm .

【Claim 4】

5 The compensator film for LCD as set forth in claim 1 or claim 2, wherein the polymer base layer has negative optical retardation up to 200 nm in out of plane direction defined as the above formula 1.

【Claim 5】

10 The compensator film for LCD as set forth in claim 1 or claim 2, wherein the polymer base layer has positive optical retardation at least 20 nm in the in-plane direction defined as the following formula 2.

[Mathematical Formula 2]

$$R_{in} = (n_x - n_y) \times d$$

15 Wherein, R_{in} indicates an intrafacial optical retardation of a film, n_x indicates a reflective index in optical axis direction of a film, n_y indicates reflective index at a right angle to optical axis of a film and d indicates a thickness of a film.

【Claim 6】

20 The compensator film for LCD as set forth in claim 1, wherein the organic/inorganic hybrid composition is a mixture comprising organic silane, metal alkoxide water and filler.

【Claim 7】

25 The compensator film for LCD as set forth in claim 6, wherein the organic

silane is included in amount of 20 ~ 99.99 weight part based on 100 weight part of the whole composition.

【Claim 8】

5 The compensator film for LCD as set forth in claim 6, wherein the metal alkoxide is included in amount of 20 ~ 70 weight part based on 100 weight part of the whole composition.

【Claim 9】

10 The compensator film for LCD as set forth in claim 1, wherein the organic protective layer is made from monomer group having UV hardened or heat hardened acrylate, methacrylate and acrylate/methacrylate.

【Claim 10】

15 The compensator film for LCD as set forth in claim 1, wherein the organic/inorganic hybrid composition is a resin composition that is characterized by being able to be UV hardened or heat hardened and including a hardening catalyst and an acrylic resin selected from a group consisting of silica-dispersed oligomer solution of organic silane produced by the partial-hydrolysis of hydrolyzed organic silane from 20 colloidal silica dispersed in organic solvent, water or a mixture thereof, acrylate oligomer, methacrylate oligomer and acrylate/methacrylate oligomer.

【Claim 11】

25 The compensator film for LCD as set forth in claim 1, wherein the organic/inorganic hybrid composition contains silicone oligomer solution having at least

two acrylate functional groups obtained from hydrolysis of silicone coupling agent and oil colloid silica which are able to be UV-hardened or heat-hardened, acrylate oligomer solution, acrylate monomer solution and photo-initiator and/or thermal initiator.

5 **【Claim 12】**

The compensator film for LCD as set forth in claim 1, wherein the protective layer is 0.01 ~ 10 μm in thickness.

【Claim 13】

10 The compensator film for LCD as set forth in claim 1, wherein the polymer coating layer is polyarylate coated with the thickness up to 10 μm and having negative optical retardation at least 10 nm defined as the above formula 1.

【Claim 14】

15 The compensator film for LCD as set forth in claim 1, wherein the film characteristically has negative optical retardation at least 10 nm in thickness direction defined as the above formula 1.

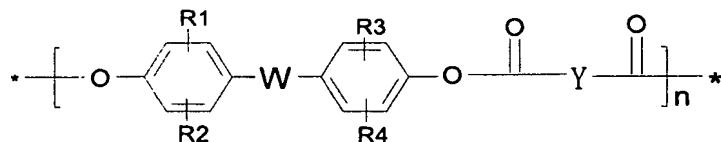
【Claim 15】

20 The compensator film for LCD as set forth in claim 1, wherein the total film is 20 ~ 300 μm in thickness.

【Claim 16】

25 The compensator film for LCD as set forth in claim 13, wherein the polyarylate is a polymer represented by the following formula 1.

[Formula 1]



Wherein, R1, R2, R3 and R4 are independently hydrogen, C₁~C₁₂ alkyl, C₆~C₁₂ arylalkyl, C₆~C₁₂ aryl, C₁~C₁₂ nitrile, C₁~C₁₂ alkoxy, C₁~C₁₂ acyl or halogen,
5 W is C₁~C₃₀ alkylidene, C₂~C₃₀ alkylene, C₃~C₃₀ cycloalkylidene, C₃~C₃₀ cycloalkene or C₁~C₃₀ phenyl-substituted alkylene, fluorene, oxygen, sulfur, sulfoxide, sulfone or single bond.

And, -OOCYCO- can be one of terephthalic acid, isophthalic acid, dibenzoic acid or naphthalene dicarboxylic acid in which aromatic group can be substituted with a
10 substituent selected from a group consisting of C₁~C₈ alkyl, aryl, alkylaryl and halogen, and/or a mixture comprising at least two of the above.

【Claim 17】

The compensator film as set forth in claim 13, wherein weight average
15 molecular weight of the polyarylate is at least 20,000 g/mol.

【Claim 18】

A LCD comprising the compensator film of claim 1.

20 【Claim 19】

The LCD as set forth in claim 18, which is selected from a group consisting of vertical alignment LCD, twist nematic LCD and sheet switching LCD.

【Claim 20】

The LCD as set forth in claim 18, wherein the LCD is vertical alignment LCD.